DEPARTMENT OF ECOLOGY
State of Washington

Technical Support Document for Boise White Paper, LLC

PSD 18-01

Wallula Pulp and Paper Mill
No. 3 Paper Machine Modification

September 2018

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Washington State Department of Ecology

Olympia, Washington

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1. Executive Summary

Boise White Paper, LLC (Boise) operates a pulp and paper mill in Wallula, Washington, referred to as the Wallula Mill. The Wallula Mill currently produces Kraft and NSSC paper products at the pulp and paper mill. In addition, a container plant is also co-located in Wallula.

The Prevention of Significant Deterioration (PSD) project referred to as the #3 Paper Machine Modification Project (#3 PM modification or project) will make the following changes to the mill:

1.1. Physical modifications

1.1.1. #3 PM

- The #3 PM is being modified to increase its design capacity of unbleached Kraft linerboard. Pulp and large amounts of water slurry are fed to the #3 PM headbox where it is applied to a wire, forming a wet sheet. The wet sheet travels to the press section and dryer section to remove water. The #3PM will be modified by adding a new head box, press, and dyer section to remove water. Minor VOC containing additives will be used by the #3 PM. The #3PM direct fire heaters and costing operations will be shut down.
- The maximum daily capacity of the current #3PM is about 800 machine dried tons per day (MDT/day). The #3 PM will be modified to unbleached linerboard at 1,400 MDT/day capacity (annual average). The maximum daily nominal paper production capacity will be 1,680 MDT/day. 1.1.2. #2 M&D digester
- The #2 M&D Digester is being modified by replacing the Bauer feed valve and a larger Sawdust blower. The #2 M&D Digester feed valve will increase daily throughput from 210 Oven Dry Tons Pulp/day (ODTP/day) to 300 ODTP/day.
- Emissions from the #2 M&D Digester are routed to the Noncondensible Gas (NCG) system. Boise is proposing to add a white liquor scrubber to the NCG system for chemical recovery, which will also reduce Total Reduced Sulfur (TRS) emissions. The annual TRS emissions will be reduced except during periods when the white liquor scrubber is down, short-term emissions will increase. The NCG system has three control options (control options are part of the NCG system emission unit) as follows that will see an increase in VOC emissions:
    - Combustion in lime kiln – full year operations with wet scrubber (reduced SO_2 emissions).
    - Combustion in hog fuel boiler – NCG control limited to 1,200 hours per year and 102 tpy SO_2 per minor permit limits.
    - NCG auto vent – MACT venting limited up to 87 hours per year/<1% semi-annual operating time (excluding startup, shutdown, and malfunctions).

- Boise stated that the increase in VOC combusted in the lime kiln or hog fuel boiler would offset fuel usage for the lime kiln and hog fuel boiler. Ecology calculated an increase in VOC within the NCG system due to the project at about 250 tpy or 6,500 MMBtu/yr (propane). The lime kiln and hog fuel boiler will therefore have an increase in CO and NO_X of less than one tpy each pollutant per NCG emission unit.
- Boise states that no other equipment is being modified.

The following equipment will have an increase in emissions a result of an increase in utilization:

- No. 2 recovery furnace
- No. 3 recovery furnace
- No. 2 smelt dissolving tank
- No. 3 smelt dissolving tank (the stack will increase from 51.3 meters to 61.51 meters
- Lime kiln (minor increase from No. 2 M&D digester/NCG)
- Black liquor tanks
- Slaker
- Makedown tank
- Kamyr digester
- #1 M&D digester
- Brownstock washers
- Knot tank
- Deckers
- Softwood storage pile
- Sawdust storage pile
- Softwood/sawdust handling
- Softwood/sawdust blowers (other than sawdust blower to No. 2 M&D digester)
- Vehicle travel
- Wastewater treatment
- NCG auto vent (minor increase from the No. 2 M&D digester)
- The No. 2 paper machine will also be affected by the project, because it will receive approximately 10 percent of its supply of pulp from the No. 2 M&D digester. However, its utilization and emissions are not increasing, because this increase in Kraft pulp will offset NSSC pulp, which has a higher paper machine emissions factor for VOC than Kraft pulp with clean condensate.

The following equipment was formally shutdown in Department of Ecology Order, No. DE-18AQIS-15757.

- The #1 paper machine was shut down on December 2016.
- The bleach plant was permanently shut down in May of 2018.

- Bleach plant seal tank
- Bleach plant scrubber
- E2 hood exhaust
- E2 tower
- E1 tower
- R8 chlorine dioxide generator/scrubber
- Bleach plant (general)

Equipment unaffected by the project:

- Neutral Sulfite Semi chemical (NSSC) pulping process
- NSSC DKP presses
- NSSC filtrate tank
- Box clipping cyclone – container plant
- Starch silo – container plant
- Corrugator – container plant
- No. 1 & No. 2 power boilers
- Hog fuel boiler (minor increase from No. 2 M&D digester/NCG)
- The increase in recovery furnaces steam generation is estimated at 229,000 lb/hr (annual average) and site wide steam demand of 226,000 lb/hr.

Construction on this project is expected to begin in October 2018, and the modified #3 paper machine and #2 M&D digester equipment is expected to start operating in the 4th quarter of 2018.

A PSD analysis for this project determined that it would have physical or operational changes that qualify as a major modification. Estimated project emissions are above the PSD significant emission rate (SER) thresholds both before and after considering significant net emission increases and/or decreases associated with this project for each of the following pollutants: nitrogen oxides (NO_X) and carbon monoxide (CO). Ecology issues this permit to cover the emissions of NO_X and CO.

Greenhouse gas (GHG) emissions are regulated in the state of Washington as biogenic and non-biogenic (11,130 tpy of CO_2e non-biogenic, 99,473 biogenic CO_2 and total 110,603 tpy CO_2e). Ecology has determined based on the following facts. Boise #2 and #3 recovery furnaces emit carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals shall not be considered a GHG (state of Washington) as long as the region's silvicultural sequestration capacity is maintained or increased (RCW 70.235.020(3)). Washington State's SIP contained in 40 CFR 52.2497 allows EPA Region 10 to issue biogenic GHG PSD permits in the state of Washington.

A full technical review of the project for these pollutants (NOx and CO), including a Best Available Control Technology (BACT) analysis, and the project's effect on national ambient air

quality standards (NAAQS), PSD increments, visibility, soils, and vegetation, is required and included in the technical support document (TSD) prepared by the Washington State Department of Ecology (Ecology) on July 19, 2018.

The emissions of other non-GHG air pollutants not subjected to PSD review are covered in the Ecology's Industrial Section Notice of Construction (NOC) approval for this project. EPA Region 10 will issue the GHG PSD permit for this project.

All of these modifications will meet air quality regulations as part of this PSD permit.

The Washington State Department of Ecology (Ecology) received the initial PSD application on January 9, 2018, and the application fee on December 21, 2017. Boise provided a revised application on June 1, 2018. Boise submitted supplemental material to Ecology on June 22, 2018, and Ecology determined Boise's application to be complete on June 25, 2018.

2. Introduction

2.1. The permitting process

2.1.1. The PSD process

PSD permitting requirements in Washington State are established in Washington Administrative Code (WAC) 173-400-700 through 750 (Title 40, Code of Federal Regulations (CFR) 52.21).

Washington State implements its PSD program as a State Implementation Plan (SIP)-approved program. This SIP-approved program became effective May 29, 2015.[1]

State and federal rules require PSD review of all new or modified air pollution sources that meet certain criteria in an attainment or unclassifiable area with the NAAQS. The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere by a proposed new major source, or major modification to an existing major source. The program limits degradation of air quality to that which is not considered "significant."

Under WAC 173-400-720 through 750, a project proposed at an existing major stationary source is subject to PSD review if the project either is a "major modification" to an existing "major stationary source," or is a major stationary source unto itself. The Boise Wallula site is currently a major stationary source.

To be considered a major modification, the following three project aspects are considered: physical or operational changes resulting from the project, project emissions compared with significant emission rates (SER), and significant net emission increases (and/or decreases).

Unless a physical change or change in the method of operation of a major stationary source is exempted by applicable regulation 40 CFR 52.21(b)(2)(iii)(a through k), it is a major modification if the change results in both a significant emissions increase and a significant net emissions increase at the source. "Significant emissions increase" means that the emissions increase for any regulated PSD pollutant is greater than the PSD SER threshold for that regulated pollutant.

This project will have physical or operational change consistent with the definition of "major modification" in 40 CFR 52.21(b)(2)(i). In addition, estimated project emissions are above the PSD SER thresholds both before and after considering significant net emission increases and/or decreases associated with the project for each of the following pollutants: nitrogen oxides (NO_X), carbon monoxide (CO), and biogenic greenhouse gases (CO_2e).

PSD rules are designed to keep an area with "good" air in compliance with the National Ambient Air Quality Standards (NAAQS). The distinctive requirements of PSD are Best Available Control Technology (BACT), air quality analysis (allowable increments and comparison with the NAAQS), and analysis of impacts of the project on visibility, vegetation, and soils.

[1] 80 FR 23721, April 29, 2015.

PSD rules require the utilization of BACT for certain new or modified emission units, which is the most effective air pollution control equipment and procedures that are determined to be available after considering environmental, economic, and energy factors.

A full technical review of the project for these pollutants, including a (BACT) analysis, and the project's effect on NAAQS, PSD increments, visibility, soils and vegetation, is required and included in this technical support document (TSD). Greenhouse gas (GHG) emissions are regulated in the state of Washington as biogenic and non-biogenic (11,130 tpy of CO_2e non-biogenic and 99,473 tpy CO_2 biogenic). Ecology has determined based on the following facts. Boise #2 and #3 recovery furnaces emit carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals shall not be considered a GHG (state of Washington) as long as the region's silvicultural sequestration capacity is maintained or increased (RCW 70.235.020(3)). Washington State's SIP contained in 40 CFR 52.2497 allows EPA Region 10 to issue biogenic GHG PSD permits in the state of Washington.

The emissions of other non-biogenic air pollutants not subjected to Washington State PSD review are covered in the Ecology Industrial Section's Notice of Construction (NOC) approval for this project.

A summary of project component descriptions is provided in Section 2.2.2., with a more detailed PSD review process description for this project provided in Section 3. BACT information for this project is included in Section 4. An ambient impact analysis is presented in Section 5 and an additional growth impact analysis is presented in Section 6. These sections form the basis of the permit approval conditions.

2.1.2. The NOC process

This project is subject to NOC permitting requirements under state of Washington regulations Chapters 173-400 and 173-460 (and/or local air regulations where applicable). Ecology's Industrial Section is the permitting authority for air pollutants not included in PSD permitting. This includes the New Source Review (NSR) permitting of criteria pollutants that are not PSD-applicable, air toxics issues under federal maximum achievable control technology (MACT) and state 173-460 WAC, and Title V permitting requirements. The procedure for issuing an NOC permit was established in Chapter 70.94 RCW.

WAC 173-400-110 outlines the NSR procedures for permitting criteria pollutants. These procedures are further refined in WAC 173-400-113 (requirements for new sources located in attainment or unclassifiable areas) and/or local air requirements where applicable. WAC 173-460-040 NSR supplements the requirements contained in Chapter 173-400 WAC (and/or local air requirements where applicable) by adding additional requirements for sources of toxic air pollutants (TAPs).

2.2. Site and project description

2.2.1. Site description

The Boise facility is located in a Class II area that is designated as "attainment or unclassifiable" for the purpose of PSD permitting for all pollutants. $PM_{2.5}$ has been monitored in Kennewick since 2007 while ozone monitoring started in 2015. Ozone designation was based on 2015 and 2016 data only.

2.2.2. Project description

The proposed project will not increase the current footprint acreage of the site. The mill produces paper products.

2.2.2.1. Physical modifications

2.2.2.1.1. #3 PM

- The #3 PM is being modified to increase its design capacity of unbleached Kraft linerboard. Pulp and large amounts of water slurry are fed to the #3 PM headbox where it is applied to a wire, forming a wet sheet. The wet sheet travels to the press section and dryer section to remove water. The #3PM will be modified by adding a new head box, press, and dyer section to remove water. Minor VOC containing additives will be used by the #3 PM. The #3PM direct fire heaters and costing operations will be shut down.
- The maximum daily capacity of the current #3PM is about 800 machine dried tons per day (MDT/day). The #3 PM will be modified to unbleached linerboard at 1,400 MDT/day capacity (annual average). The maximum daily nominal paper production capacity will be 1,680 MDT/day. 1.1.2. #2 M&D digester

2.2.2.1.2. #2 M&D Digester

- The #2 M&D Digester is being modified by replacing the Bauer feed valve and a larger Sawdust blower. The #2 M&D Digester feed valve will increase daily throughput from 210 Oven Dry Tons Pulp/day (ODTP/day) to 300 ODTP/day.
- Emissions from the #2 M&D Digester are routed to the Noncondensible Gas (NCG) system. Boise is proposing to add a white liquor scrubber to the NCG system for chemical recovery, which will also reduce Total Reduced Sulfur (TRS) emissions. The annual TRS emissions will be reduced except during periods when the white liquor scrubber is down, short-term emissions will increase. The NCG system has three control options (control options are part of the NCG system emission unit) as follows that will see an increase in VOC emissions:
    - Combustion in lime kiln – full year operations with wet scrubber (reduced SO_2 emissions).
    - Combustion in hog fuel boiler – NCG control limited to 1,200 hours per year and 102 tpy SO_2 per minor permit limits.

  - NCG auto vent – MACT venting limited up to 87 hours per year/<1% semi-annual operating time (excluding startup, shutdown, and malfunctions).
- Boise stated that the increase in VOC combusted in the lime kiln or hog fuel boiler would offset fuel usage for the lime kiln and hog fuel boiler. Ecology calculated an increase in VOC within the NCG system due to the project at about 250 tpy or 6,500 MMBtu/yr (propane). The lime kiln and hog fuel boiler will therefore have an increase in CO and NO_X of less than one tpy each pollutant per NCG emission unit.
- The Kraft pulp mill (will experience an increase in short-term and long-term pulp throughput but will not increase in black liquor solids (BLS) throughput on a short-term basis. The change from a low kappa pulp cook to a less intensive high kappa cook for unbleached linerboard production will reduce BLS generation per ton of pulp produced.
- Boise states that no other equipment is being modified.

The following equipment will have an increase in emissions a result of an increase in utilization:

- No. 2 recovery furnace
- No. 3 recovery furnace
- No. 2 smelt dissolving tank
- No. 3 smelt dissolving tank (the stack will increase from 51.3 meters to 61.51 meters
- Lime kiln (minor increase from No. 2 M&D digester/NCG)
- Black liquor tanks
- Slaker
- Makedown tank
- Kamyr digester
- #1 M&D digester
- Brownstock washers
- Knot tank
- Deckers
- Softwood storage pile
- Sawdust storage pile
- Softwood/sawdust handling
- Softwood/sawdust blowers (other than sawdust blower to No. 2 M&D digester)
- Vehicle travel
- Wastewater treatment
- NCG auto vent (minor increase from the No. 2 M&D digester)

The No. 2 paper machine will also be affected by the project, because it will receive approximately 10% of its supply of pulp from the No. 2 M&D digester. However, its utilization and emissions are not increasing, because this increase in kraft pulp will offset

NSSC pulp, which has a higher paper machine emission factor for VOC than kraft pulp with clean condensate.

The following equipment was formally shutdown in Department of Ecology Order, No. DE-18AQIS-15757.

- The #1 paper machine was shut down on December 2016
- The bleach plant was permanently shut down in May of 2018.
    - Bleach plant seal tank
    - Bleach plant scrubber
    - E2 hood exhaust
    - E2 tower
    - E1 tower
    - R8 chlorine dioxide generator/scrubber
    - Bleach plant (general)

Equipment unaffected by the project:

- Neutral sulfite semi chemical (NSSC) pulping process
- NSSC DKP presses
- NSSC filtrate tank
- Box clipping cyclone – container plant
- Starch silo – container plant
- Corrugator – container plant
- No. 1 & No. 2 power boilers
- Hog fuel boiler (minor increase from No. 2 M&D digester/NCG)
- The increase in recovery furnaces steam generation is estimated at 229,000 lb/hr (annual average) and site-wide steam demand of 226,000 lb/hr.

A summary of all emission units affected by the project are listed in Table 1.

Table 1: Summary of Emission Units Affected by the #3 PM

Equipment Unit	New/Existing Unit (Change in Utilization)
#3 paper machine	Modification
#2 M&D digester and sawdust blower	Modification
NCG auto vent	Part of #2 M&D digester emission unit
Lime kiln	Part of #2 M&D digester emission unit
Hog fuel boiler	Part of #2 M&D digester emission unit
No. 2 recovery furnace	Existing unit (change in utilization)
No. 3 recovery furnace	Existing unit (change in utilization)

Equipment Unit	New/Existing Unit (Change in Utilization)
No. 2 smelt dissolving tank	Existing unit (change in utilization)
No. 3 Smelt dissolving tank (the stack will increase from 51.3 meters to 61.51 meters	Existing unit (change in utilization)
Black liquor tanks	Existing unit (change in utilization)
Slaker	Existing unit (change in utilization)
Makedown tank	Existing unit (change in utilization)
Kamyr digester	Existing unit (change in utilization)
#1 M&D digester	Existing unit (change in utilization)
Brownstock washers	Existing unit (change in utilization)
Knot tank	Existing unit (change in utilization)
Deckers	Existing unit (change in utilization)
Softwood storage pile	Existing unit (change in utilization)
Sawdust storage Pile	Existing unit (change in utilization)
Softwood/sawdust handling	Existing unit (change in utilization)
Softwood/sawdust blowers (other than sawdust blower to No. 2 M&D digester)	Existing unit (change in utilization)
Vehicle travel	Existing unit (change in utilization)
Wastewater treatment	Existing unit (change in utilization)

The following figures from the application show a high-level process flow diagram of the power/recovery and pulp/washing systems. A more detailed description of the project major components is provided in the following subsections.

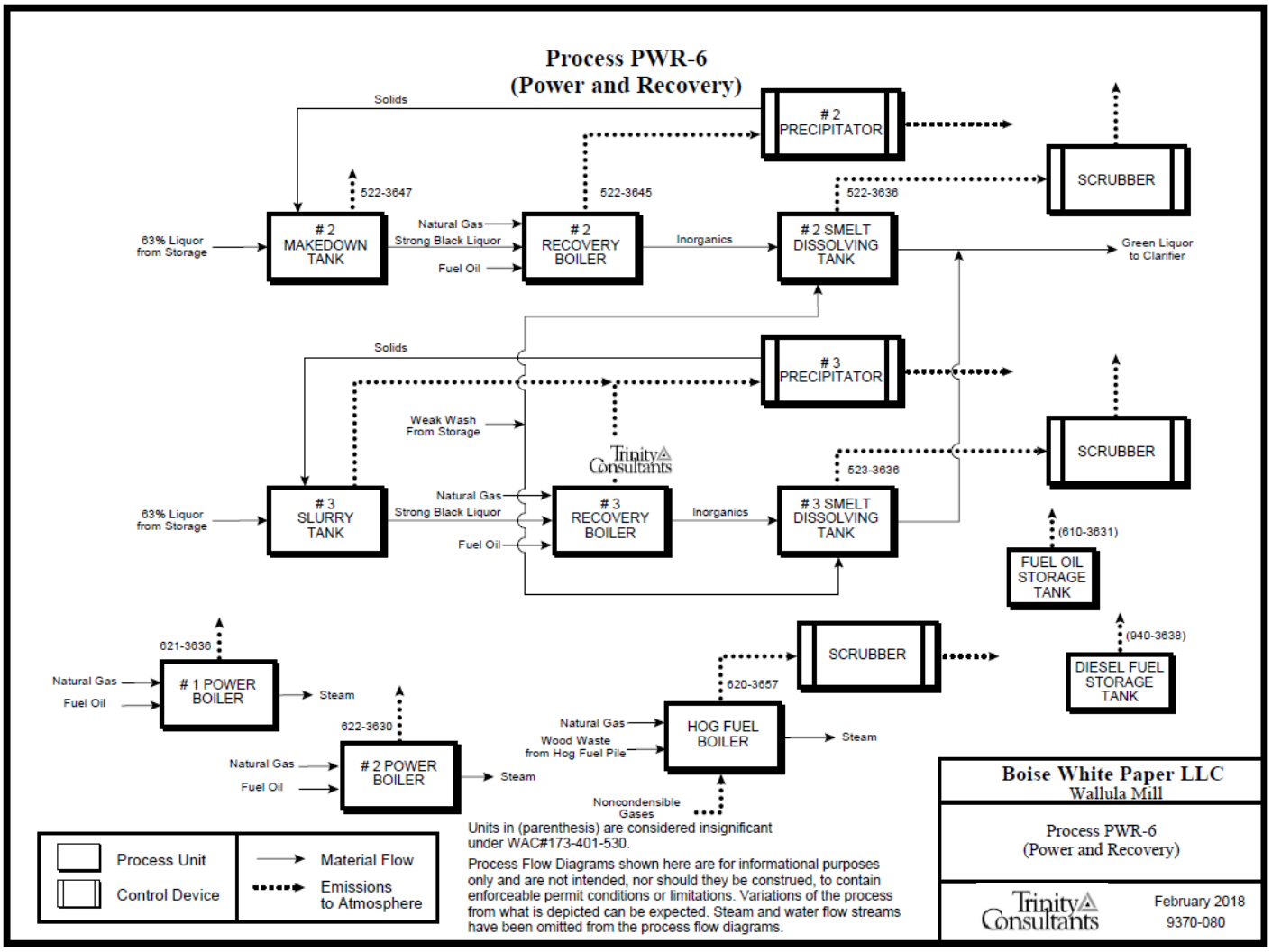

Figure 1: Process PWR-6 (power and recovery)

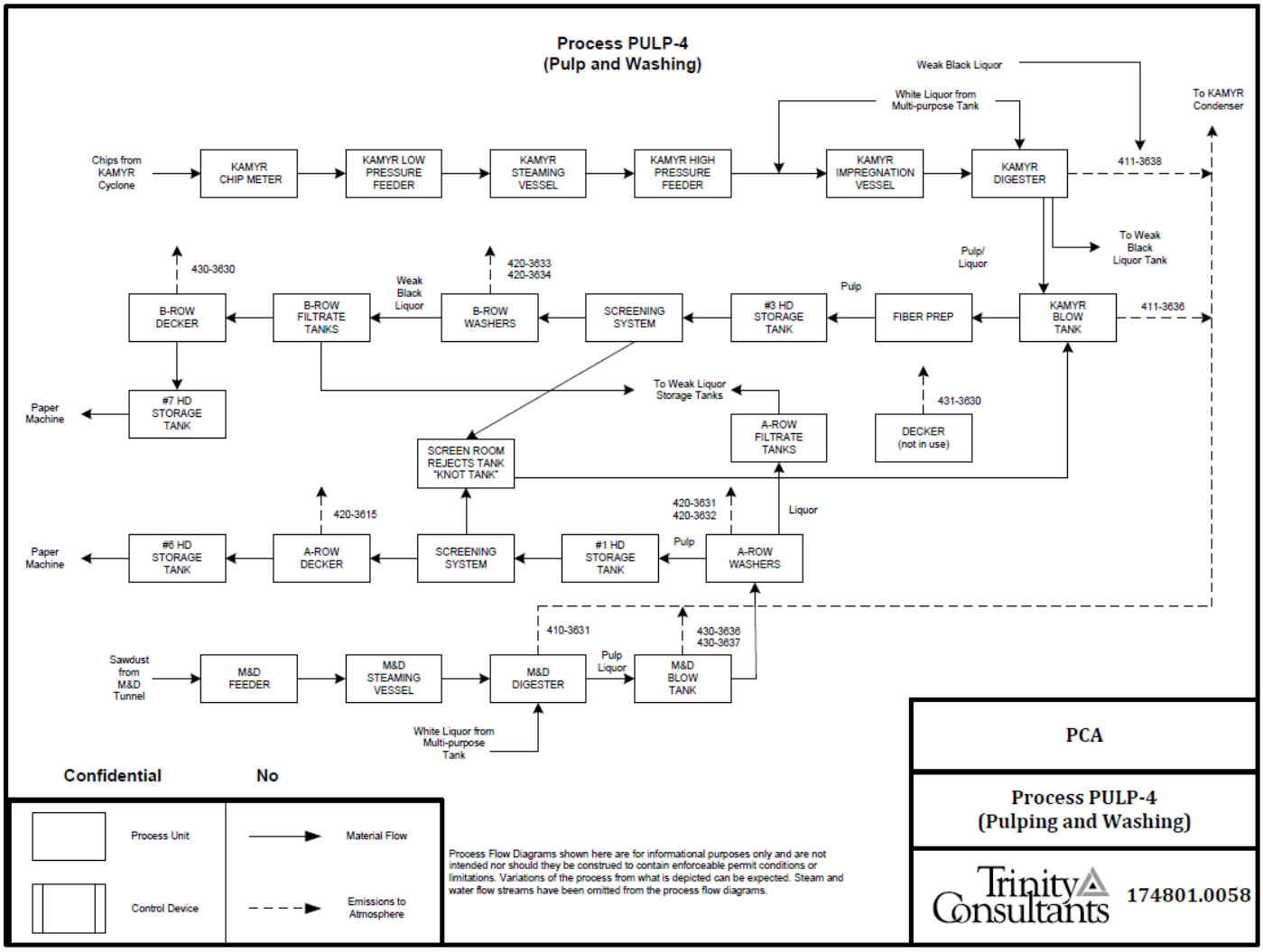

Figure 2: Process PULP-4 (pulp and washing)

2.2.2.2. The modification of the #3 PM

- The #3 PM is being modified to increase its design capacity of unbleached Kraft linerboard. Pulp and large amounts of water slurry are fed to the #3 PM headbox where it is applied to a wire, forming a wet sheet. The wet sheet travels to the press section and dryer section to remove water. The #3PM will be modified by adding a new head box, press, and dyer section to remove water. Minor VOC containing additives will be used by the #3 PM. The #3PM direct fire heaters and costing operations will be shut down.

The maximum daily capacity of the current #3PM is about 800 machine dried tons per day (MDT/day). The #3 PM will be modified to unbleached linerboard at 1,400 MDT/day capacity (annual average). The maximum daily nominal paper production capacity will be 1,680 MDT/day.

2.2.2.3. #2 M&D digester (controls NCG vent)

- The #2 M&D Digester is being modified by replacing the Bauer feed valve and a larger Sawdust blower. The #2 M&D Digester feed valve will increase daily throughput from 210 Oven Dry Tons Pulp/day (ODTP/day) to 300 ODTP/day.
- Emissions from the #2 M&D Digester are routed to the Noncondensible Gas (NCG) system. Boise is proposing to add a white liquor scrubber to the NCG system for chemical recovery, which will also reduce Total Reduced Sulfur (TRS) emissions. The annual TRS emissions will be reduced except during periods when the white liquor scrubber is down, short-term emissions will increase. The NCG system has three control options (control options are part of the NCG system emission unit) as follows that will see an increase in VOC emissions:
    - Combustion in lime kiln – full year operations with wet scrubber (reduced SO_2 emissions).
    - Combustion in hog fuel boiler – NCG control limited to 1,200 hours per year and 102 tpy SO_2 per minor permit limits.
    - NCG auto vent – MACT venting limited up to 87 hours per year/<1% semi-annual operating time (excluding startup, shutdown, and malfunctions).

Boise stated that the increase in VOC emissions (26.3 lb/hr Section 4-4 of the application) would offset fuel usage for the lime kiln and hog fuel boiler. Ecology calculated an increase in project VOC emissions from the NCG system at about 250 tpy or 6,500 MMBtu/yr (propane). The lime kiln and hog fuel boiler will therefore have an increase in CO and NO_X of less than 1 tpy each pollutant per emission unit.

The Kraft pulp mill (will experience an increase in short-term and long-term pulp throughput but will not increase in black liquor solids (BLS) throughput on a short-term basis. The change from a low kappa pulp cook to a less intensive high kappa cook to unbleached liner board will reduce BLS generation per ton of pulp produced.

2.2.2.4. Kamyr Kraft digester (controls NCG)

The project will increase the utilization of the Kamyr Kraft digester/pulp mill.

The application states the maximum pulp production (annual average) will increase to 980 ODT/day from the Kamyr pulp mill and unchanged from the M&D plant at 365 ODT/day (total 1345 ODT/day) (annual average). The Kamyr cooking operation will change by using less chemical and shorter cooking time.

On August 6, 2018, Boise requested a proposed kraft pulp limit of 1,345 ODT/day (annual average) and total BLS annual limit of 1,327 million lbs/year. The original limit was for separate M&D and Kamyr digester limits. This email correspondence has been attached to the permit application. This was added as a BACT requirements for the modification to the digesters.

2.2.2.5. Low-volume, high concentration – NCG system

The low-volume, high concentration NCG system is being changed to add a white liquor scrubber to increase sulfur recovery (TRS and SO_2). The NCGs is collected from applicable equipment includes the #1 and #2 M&D digesters, the NSSC digester, the Kamyr digester, the #1 evaporator seal tank, #2 evaporator seal tank, #3 evaporator seal tank, foul condensate tank, lime kiln condensate collection tank, hog fuel boiler condensate collection tank, and the LVHC condensate collection system. Emissions can be routed to the lime kiln (SO_2 controls), hog fuel boiler (no SO_2 controls), or the auto valve. The auto valve is the only uncontrolled emission point. Emissions are expected to increase due to more utilization and due to the modification of the #2 M&D digester.

2.2.2.6. NCG white liquor scrubber

The facility will be installing a white liquor scrubber to enhance chemical recovery of sulfur compounds from the mill's NCG stream. There will be no increase in TRS or SO_2 on an annual basis. Emissions reductions have not been accounted for in the applications. Boise stated that NCG represents a tiny fraction of the lime kiln and hog fuel boiler heat input. Boise indicated that an increase in VOC/fuels will be offset by a corresponding decrease in traditional fuel and will have no measurable impact on emissions of NO_X or CO.

2.2.2.7. Brown stock washers and deckers (emission inventory – pulping and washing)

The brown stock washers are used to recover chemical to be reused in the mill. The deckers are used to remove water to allow for more storage volume. Historically, the pulping and washing emissions have been a single source in the emission inventory. In the application, Boise has separated the mill into the two emission points brown stock washer and deckers. Emissions are expected to increase due to increased utilization. In April of 2018, NACSI wrote to Boise supporting the use of emissions factors for historical bleach Kraft pulp and unbleached Kraft that resulted in a reduction in VOC and TRS emissions in the application.

2.2.2.8. Knot tank (part of other in the emission inventory)

The existing Knot tank takes M&D washed pulp and Kamyr feed prior to washing rejects and recycles the material back to the Kamyr blow tank for additional fiber prep.

2.2.2.9. Three pulp mill liquor tanks (part of other in the emissions inventory)

The existing three tanks from the application are identified as 14 percent weak black liquor tanks, 44 percent intermediate black liquor tank, and 63 percent heavy black liquor tank. Emissions are based on tank size thus no increase in project emissions.

2.2.2.10. Makedown (part of other in the emissions inventory)

The existing makedown tank is used prior to the recovery furnaces to reintroduce solids from ESP into the recovery furnaces.

2.2.2.11. #2 recovery furnace (same as the emissions inventory)

The existing #2 recovery furnace has not fired black liquor since 2012. The mill has records that the unit has made steam after 2012. The mill has minimally fired the unit on natural gas. The unit has been maintained to produce steam as needed during other unit maintenance periods. The mill has identified two sets of activities, inspection, and repair as needed. And, update of equipment to current controls and safety standards. These activities will not increase design capacity or actual performance of the furnace (steaming rate, rated heat input capacity, or BLS firing rate). Boise has indicated that these activities qualify as routine maintenance and repair. Ecology's review was not based on these activities meeting this definition.

2.2.2.12. #3 recovery furnace (same as the emissions inventory)

The existing #3 recovery furnace has been the only unit firing black liquor since 2012.

2.2.2.13. #2 smelt tank (same as the emissions inventory)

The existing #2 smelt tank has been idled since the #2 recovery furnace has not been firing black liquor for six years.

2.2.2.14. #3 smelt tank (same as the emissions inventory)

The existing #3 smelt tank has been operated continuously. Boise proposes to increase the height of the #3 smelt dissolving tank stack to at least 61.51 meters. The higher stack was not relied on for modeling.

2.2.2.15. Lime kiln (same as the emissions inventory)

The existing lime kiln has been operating at its lower operating range. In the future, the lime kiln will be operating at near capacity with lower NO_X emission factors. The lime kiln is the normal control for the NCG system.

2.2.2.16. Slaker (part of other in the emissions inventory)

The existing slaker should have minor increase in emissions.

2.2.2.17. Storage piles (part of Transfer/Conveying: vehicles, chip piles, etc.)

The storage piles will increase in size to accommodate the increase in pulping rate.

2.2.2.19. Steam demand

The steam demand historically has been 565,000 lb/hr (annual average) and will increase to 791,000 lb/hr (annual average). The demand will increase by 226,000 lb/hr (annual average) with the recovery furnace generating an additional 229,000 lb/hr (annual average).

2.2.2.20. Historic and projected annual throughputs

The project will result in a daily increase in pulp throughput due to the #2 M&D digester modification but no increase in short-term BLS throughput at the recovery furnaces.

3. PSD Applicability Review

3.1. Overview and permitting history

As noted in Section 2.1.1, the proposed project will require a PSD permit because both the project's emissions (increase/decreases) and the net contemporaneous emissions increase/decreases caused by the project exceed PSD SERs for NSR pollutants, including greenhouse gases (GHGs). This section describes how the PSD applicability determination was performed.

The proposed project at Boise requires PSD review. In accordance with the requirements of 40 CFR 52.21(a)(2), these emission increases associated with the modified and existing units can be based on their potential to emit (PTE) or modified units is projected actual emissions and baseline actual emissions (BAE). BAE is defined in 40 CFR 52.21(b)(48) as "means the rate of emissions, in tons per year, of a regulated NSR pollutant, as determined in accordance with paragraphs (b)(48)(i) through (iv) of this section.

(i) For any existing electric utility steam generating unit, baseline actual emissions means the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding when the owner or operator begins actual construction of the project. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation.

(a) The average rate shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.

(b) The average rate shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above any emission limitation that was legally enforceable during the consecutive 24-month period.

(c) For a regulated NSR pollutant, when a project involves multiple emissions units, only one consecutive 24-month period must be used to determine the baseline actual emissions for the emissions units being changed. A different consecutive 24-month period can be used for each regulated NSR pollutant.

(d) The average rate shall not be based on any consecutive 24-month period for which there is inadequate information for determining annual emissions, in tons per year, and for adjusting this amount if required by paragraph (b)(48)(i)(b) of this section.

(ii) For an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.

(a) The average rate shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.

(b) The average rate shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above an emission limitation that was legally enforceable during the consecutive 24-month period.

(c) The average rate shall be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had such major stationary source been required to comply with such limitations during the consecutive 24-month period. However, if an emission limitation is part of a maximum achievable control technology standard that the Administrator proposed or promulgated under part 63 of this chapter, the baseline actual emissions need only be adjusted if the State has taken credit for such emissions reductions in an attainment demonstration or maintenance plan consistent with the requirements of § 51.165(a)(3)(ii)(G) of this chapter.

(d) For a regulated NSR pollutant, when a project involves multiple emissions units, only one consecutive 24-month period must be used to determine the baseline actual emissions for all the emissions units being changed. A different consecutive 24-month period can be used for each regulated NSR pollutant.

(e) The average rate shall not be based on any consecutive 24-month period for which there is inadequate information for determining annual emissions, in tons per year, and for adjusting this amount if required by paragraphs (b)(48)(ii)(b) and (c) of this section.

(iii) For a new emissions unit, the baseline actual emissions for purposes of determining the emissions increase that will result from the initial construction and operation of such unit shall equal zero; and thereafter, for all other purposes, shall equal the unit's potential to emit.

Boise is using EPA's Memorandum: "Project Emissions Accounting Under the New Source Review Preconstruction Permitting Program" which was published on March 30, 2018 (83 FR 13745) to determine if the project is having a significant emissions increase. Ecology is reviewing this guidance and will implement the guidance on a case-by-case basis. The use of the guidance did not exclude Boise from being subject to PSD (NO_X and CO). Boise did perform NO_X annual NAAQS and increment modeling within regulatory limits.

Ecology has determined that the additional review of VOC, PM_{10}, and $PM_{2.5}$ is not warranted. Since 1992, Boise has had projects to reduce emissions of PM_{10} and $PM_{2.5}$ thus expanding the increment. The non-PSD pollutants will be required to demonstrate BACT in the minor air permit.

After determining in Section 2.1.1. that there are no physical and operational changes of this project exempted by 40 CFR 52.21(b)(2)(iii)(a through k), (Step 1), the significant emissions increase/decrease analysis looks only at the emissions from the proposed project and is referred to here as Step 2. The significant net emissions increase analysis looks at additional increases and decreases from "contemporaneous" projects at the source and is referred to here as Step 3.

For the significant emissions increase/decrease analysis, the review involves both new emissions units and modification of existing units. The PSD regulations require use of the hybrid test for projects that involve both the addition of new emissions units and the modification of existing emissions units (40 CFR 52.21(a)(2)(iv)(f)). Under the hybrid test, a significant emissions increase/decrease of a regulated NSR pollutant is projected to occur if the sum of the emissions increases/decreases for each emissions unit, using the actual (BAE)-to-projected-actual applicability test (40 CFR 52.21(a)(2)(iv)(c) for modified units and the actual(BAE)-to-potential applicability test (40 CFR 52.21(a)(2)(iv)(d)) for new units, equals or exceeds the significance threshold for that pollutant as defined in paragraph 40 CFR 52.21(b)(23).

The actual (BAE)-to-projected-actual applicability test involves adding the projected actual emissions from existing emissions units that are modified as part of the project or that are otherwise expected to experience an emission increase as a result of the project, and then subtracting the past actual emissions (called the "baseline actual emissions") from those units.

In lieu of projecting future actual emissions for a particular existing emissions unit, an applicant can choose instead to use the unit's PTE as the unit's post project emissions (40 CFR 52.21(b)(41)(ii)(d)). The actual(BAE)-to-potential test, which is required for all new units being constructed as part of the project, involves totaling the potential emissions of the proposed new emissions units, then subtracting baseline actual emissions of those units. A new unit that is being constructed as part of the project has a baseline actual emission rate of zero (40 CFR 52.21(b)(48)(iii)).

If the project would result in a significant emissions increase, then a significant net emissions increase analysis is often conducted. However, EPA has clearly stated that calculating a net emissions increase is at the source's option (see, for example, 67, Federal Register 80186, at 80197 [December 31, 2002]). Therefore, a source may seek a PSD permit based on a calculated significant emission increase/decrease alone. The mill is an existing major source for PSD, Boise found that emissions for three (3) regulated NSR pollutants were considered to have significant emissions increases. Boise also performed a netting analysis with no pollutant netting out of PSD (see Sections 3.3.1 and 3.3.2). Because of the netting analysis, three pollutants had significant net emissions increases.

The modification of the #3 paper machine and #2 M&D digester, therefore, triggers PSD review for the three regulated NSR pollutants.

3.2. Significant emissions increases calculation

The project will involve modifying existing emission units. Therefore, the hybrid test, described in the previous section, is required. Test results for modified units are presented in this section followed by a summary hybrid test table.

3.2.1. Actual-to-potential test for new project units

No new emissions units.

3.2.2. Actual (BAE)-to-projected-actual applicability test for modified, debottlenecked, or other affected emissions units

Debottlenecking is the term used for situations when emission units upstream or downstream from the unit(s) undergoing a physical change or change in the method of operation will experience an emission increase as result of the project.

Other affected emissions units could experience increased utilization due to the project. Boise has determined that certain emission units upstream or downstream from the unit(s) undergoing a physical change or change in the method of operation will experience increased utilization as result of the project. Additional emissions from units with increased utilization are calculated using an actual (BAE)-to-projected-actual applicability test.

As described in Section 3.1, the actual (BAE)-to-projected-actual applicability test involves adding the projected actual emissions from existing emissions that are expected to experience an emission increase/decrease as a result of the project, and then subtracting the past actual emissions (called the "baseline actual emissions") from those units.

When calculating projected actual emissions, 40 CFR 52.21(b)(41)(ii)(c) requires that Boise: "Shall exclude, in calculating any increase in emissions that results from the particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under paragraph (b)(48) of this section and that are also unrelated to the particular project, including any increased utilization due to product demand growth…" These emissions are referred to in this TSD as "Excludables." Boise did not use demand growth exclusion because the majority of the emissions were a result of the project.

For existing emission units that are being modified, debottlenecked, or other affected units experiencing increased utilization as part of the project, the PSD baseline actual emissions are emissions averaged over a 24 consecutive month period. According to 40 CFR 52.21(b)(48)(ii), the 24-month period must occur "within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received."

For a regulated NSR pollutant, when a project involves more than one emission unit, only one 24 consecutive month period may be used to determine the baseline actual emissions for all emission units being changed. However, a different 24 consecutive month period can be used for each regulated NSR pollutant (40 CFR 52.21(b)(48)(ii)(d)).

For baseline emissions, Boise chose the following 24-month periods for the pollutant:

Table 2: Boise's Chosen Dates for Baseline Actual Emissions

24-month Period	Pollutant(s)
January 2008–December 2009	PM, PM_{10}, $PM_{2.5}$, Lead
January 2010–December 2011	NO_X, CO_2e, SO_2, H_2SO_4, VOC, TRS
January 2013–December 2014	CO

3.2.2.1. Start-up and shutdown, and malfunction (SSM) emissions

This project does not have any elevated emissions from startup and shutdown that need to be accommodated. In addition, no alternative operating modes that needs to be considered.

3.2.3. Changes from historical emission inventory

The PSD emissions followed historical methodologies with the following exceptions:

- VOC emissions were calculated on as-compound basis rather than an as-carbon basis.
- Condensable PM emissions were added.
- VOC emissions from the NCG auto vent were added.
- The historical emissions did not include emissions from the paper machines except for the VOC from coating.
- Previous inventories included NO_X emissions from smelt dissolving tanks. NCASI believes this was a faults reading due to ammonia.
- The decker and the decker filtrate tank emissions were historically over reported.

The following equipment has been updated based on the newest NCASI emission factors.

- Knot tank
- Decker filtrate tank
- 63% - Heavy black liquor tank
- 44% - Intermediate black liquor tank
- 14% - Week black liquor tank
- Makedown tank
- Slaker
- NCG auto vent

3.2.3.1. No. 3 paper machine actual (BAE)-to-projected-actual applicability test

Table 3 presents Boise's estimated emissions for the No. 3 PM.

Table 3: Emissions Increases of Regulated NSR Pollutants for No. 3 Paper Machine (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	1.21	0.54	4.38	4.38	3.29	0.0	0.0	4.88	0.0	*	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
Projected emissions	0.0	0.0	5.15	5.15	2.58	0.0	0.0	33.14	0.0	*	*
Change in emissions	-1.21	-0.54	0.77	0.77	-0.71	0.0	0.0	28.26	0.0	*	*

∗ Zero, negligible, or not applicable.

Boise had not reported these emissions in the past annual emissions inventory. The past emission factors were based on bleached Kraft coated paper while the projected emissions are based on unbleached Kraft paper. The PM and VOC emissions factors were taken from NCASI Technical Bulletin No. 1020 and 973. One PM test for projected emissions and median of three PM test for BAE. The NCASI articles identified various sources of VOC, chemicals added at the paper machine, VOC contained in the pulp (bleached or unbleached). The VOC contained in the pulp is a function of the water used to recover chemicals and clean the pulp (Clean Condensate Alternative - CCA). In 2003, Ecology approved Boise's CCA plan to reduce HAP's from the Kraft mill. The projected emission factor for VOCs from paper machines is derived from the value presented in Table 4.33, NCASI Technical Bulletin No. 973, Compilation of 'Air Toxic' and Total Hydrocarbon Emissions Data for Pulp and Paper Mill Sources – A Second Update, February 2010. The VOC emission factor of 0.51 lb/ADTFP represents non-CCA mills, and therefore it cannot be used as is for a CCA mill such as the Wallula mill. The factor is adjusted to be representative of CCA Mills by multiplying it by an adjustment ratio. This adjustment ratio is determined by dividing the acetaldehyde, methanol, and formaldehyde emission factors in Table 4.33, (converted to a lb C basis) for CCA mills by non-CCA mills, given that these are the only factors that provide a direct comparison between both types of mills. The VOC emission factor (as C) is converted to a lb VOC basis based on the carbon content of the VOC constituents in the Non-Clean Condensate mills which were tested for VOC. The adjustment ratio was determined as 6.88. The modified VOC (as C) emission factor is calculated as 7.41E-02 lb/ADTP. It is converted on a lb VOC basis using a lb VOC/lb VOCs (as C) ratio of 1.74, determined from the speciated HAP data for Non-Clean Condensate Mills in Table 4.33, NCASI Technical Bulletin No. 973. The resulting VOC emission factor of 0.129 lb/ADTP is used. The VOC emissions were adjusted due to emissions from coating operations.

3.2.3.2. Pulping and washing

This equipment Kamyr and M&D digesters are changing the Kappa number (coking time, chemical addition, and steam rate). The maximum historic daily Kamyr pulp rate will increase from 770 ODT/day to 980 ODT/day (annual average). The #3 PM also is projected to use up to 365 ODT/day from the M&D digesters for a total of 1,345 ODT/day. The #2 M&D digester will be modified to increase short-term capacity from 210 to 300 ODT/day. MDT includes the paper moisture while ODT is only the pulp weight.

Boise reported emissions inventory for the pulping and washing operations as following for the baseline years; VOC of 39 tpy (2009) and 46 tpy (2010) and TRS was not reported for the baseline years of 2010-2011. Boise has updated the emissions into the following areas but has not included emissions form the Neutral Sulfite Semi Chemical (NSSC) Pulping Process, which is unchanged by the project.

3.2.3.3. Brown stock washers (Kamyr and M&D digesters) actual (BAE)-to-projected-actual applicability test

Table 4 presents Boise's estimated emissions for brown stock washers.

Table 4: Emissions Increases of Regulated NSR Pollutants for Brown Stock Washers (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	163.53	0.0	55.11	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122.85	0.0	11.03	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-40.68	0.0	-44.07	*

∗ Zero, negligible, or not applicable.

Note: Separate VOC emission factors are used for bleached paper production (during the baseline period) and unbleached paper production (for projected emissions). The emission factors used are based on an analysis conducted by NCASI to distinguish between brownstock washer emissions from bleached vs. unbleached pulp production. The analysis was conducted using data from NCASI Technical Bulletin Number 973, Table A-4a (updated October 2015) for methanol emissions. The methanol emission factors are used, because they are higher than VOC emission factors determined by NCASI in the same analysis using data from Technical Bulletin Number 1020, Table A-6. The emissions rates used were developed by Dr. Zach Emerson, NCASI in a letter dated April 16, 2018.

Separate TRS emission factors are used for bleached paper production (during the baseline period) and unbleached paper production (for projected emissions). The emission factors used are based on an analysis conducted by NCASI to distinguish between brownstock washer emissions from bleached vs. unbleached pulp production. The analysis was conducted using data from NACSI Technical Bulletin Number 973, Table A-4b (updated October 2015). The emissions rates used were developed by Dr. Zach Emerson, NCASI in a letter dated April 16, 2018.

3.2.3.4. Deckers (Kamyr and M&D digesters) actual-to-projected-actual applicability test

Table 5 presents Boise's estimated emissions for Deckers.

Table 5: Emissions Increases of Regulated NSR Pollutants for Deckers (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.55	0.0	11.03	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.57	0.0	17.94	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.03	0.0	6.91	*

∗ Zero, negligible, or not applicable.

The VOC emissions factors were taken from NCASI Technical Bulletin No. 1020 and assumed that the emissions were all methanol.

3.2.3.5. Knot tank (Kamyr and M&D digesters) actual (BAE)-to-projected-actual applicability test

Table 6 presents Boise's estimated emissions for Knot Tank.

Table 6: Emissions Increases of Regulated NSR Pollutants for Knot Tank (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.79	0.0	0.03	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.29	0.0	0.04	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.50	0.0	0.01	*

∗ Zero, negligible, or not applicable.

The VOC emissions factors were taken from NCASI Technical Bulletin No. 678.

3.2.3.6. Chemical Recovery

The shutting down of the bleach plant and changes to the Kraft mill will not increase the short-term amount of black liquor generated compared to past years. The annual utilization will increase.

3.2.3.7. No. 3 recovery furnace actual (BAE)-to-projected-actual applicability test

Table 7 presents Boise's estimated emissions for No. 3 recovery furnace.

Table 7: Emissions Increases of Regulated NSR Pollutants for No. 3 Recovery Furnace (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e Total	CO2e Non-Biogenic	TRS	Pb
BAE	669.30	299.17	11.82	25.95	24.09	430.62	1.77	47.21	636,492	5,336	3.13	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
Projected emissions	980.04	331.46	17.44	32.30	29.56	465.79	1.99	53.18	734,087	8,065	3.99	*
Change in emissions	310.75	32.30	5.61	6.35	5.47	35.17	0.22	5.98	97,596	2,730	0.86	*

∗ Zero, negligible, or not applicable.

The above emissions are based on CEMS or emission test data: CO, NO_X, PM, PM_{10}, $PM_{2.5}$ (condensable added based on NCASI data), SO_2, and TRS. Projected CO emissions based on expected emissions based on 300 ppm CO concentration. Condensable PM was added to non-condensable PM test based on NCASI TB 1010.

The VOC emissions factors were taken from NCASI Technical Bulletin No. 1010 and are assumed all methanol. Lead emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills. Sulfur acid emissions factor was from NCASI TB No. 973. GHG emissions factors were from 40 CFR 98, Subpart A, AA, and C.

Boise #2 and #3 recovery furnaces emit carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals shall not be considered a GHG (state of Washington) as long as the region's silvicultural sequestration capacity is maintained or increased (RCW 70.235.020(3)).

3.2.3.8. No. 2 recovery furnace actual (BAE)-to-projected-actual applicability test

Table 8 presents Boise's estimated emissions for No. 2 recovery furnace.

Table 8: Emissions Increases of Regulated NSR Pollutants for No. 2 Recovery Furnace (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e Total	CO2e Non-Biogenic	TRS	Pb
BAE	5.34	72.74	8.36	7.65	6.34	341.70	0.33	8.75	121,628	12,242	0.37	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
Projected emissions	43.48	70.81	7.53	7.63	6.45	321.55	0.33	8.78	129,272	14,164	0.63	*
Change in emissions	38.14	-1.93	-0.83	-0.02	0.11	-20.15	0.0	0.3	7,644	1,922	0.26	*

∗ Zero, negligible, or not applicable.

The above emissions are based on CEMS or emission test data: CO, NO_X, PM, PM_{10}, $PM_{2.5}$ (condensable added based on NCASI data), SO_2, and TRS. Projected CO emissions based on expected emissions based on 300 ppm CO concentration. Condensable PM was added to non-condensable PM test based on NCASI TB 1010.

The VOC emissions factors were taken from NCASI Technical Bulletin No. 1010 and are assumed all methanol. Lead emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills. Sulfur acid emissions factor was from NCASI TB No. 973. GHG emissions factors were from 40 CFR 98, Subpart A, AA, and C.

Boise #2 and #3 recovery furnaces emit carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals shall not be considered a greenhouse gas (state of Washington) as long as the region's silvicultural sequestration capacity is maintained or increased (RCW 70.235.020(3)).

Boise supplied information supporting that the unit had generated minimal amount of steam over the years of no black liquor burning. Over the last six years, the site has done maintenance to unit to maintain its viability. The expected 2018 maintenance was reviewed and no projects were identified to increase capacity or reliability. Varies activities include inspection followed by unidentified replacement activities therefore Ecology cannot determine if these repairs will be routine maintenance or not.

3.2.3.9. No. 3 smelt dissolving tank actual (BAE)-to-projected-actual applicability test

Table 9 presents Boise's estimated emissions for No. 3 smelt dissolving tank.

Table 9: Emissions Increases of Regulated NSR Pollutants for No. 3 Smelt Dissolving Tank (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	28.43	30.60	22.85	1.52	0.0	6.74	0.0	3.07	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	39.23	41.79	31.09	1.71	0.0	7.6	0.0	3.45	*
Change in emissions	0.0	0.0	10.80	11.19	8.24	0.19	0.0	0.85	0.0	0.39	*

∗ Zero, negligible, or not applicable.

Filterable PM is based on site emission test results. NCASI memo dated August 18, 2017, on salt dissolving tank is used to estimate condensable PM material and the $PM/PM_{2.5}$ ratio. VOC and SO_2 emissions are from NCASI Technical Bulletin No. 1020. TRS and Lead emissions factors were from NCASI Air Toxics Master Summary Table for Pulp and Paper Mills. The #3 smelt dissolving tank stack will increase from 51.3 meters to 61.51 meters.

3.2.3.10. No. 2 smelt dissolving tank actual (BAE)-to-projected-actual applicability test

Table 10 presents Boise's estimated emissions for the No. 2 smelt dissolving tank.

Table 10: Emissions Increases of Regulated NSR Pollutants for No. 2 Smelt Dissolving Tank

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	2.66	3.04	2.32	0.28	0.0	1.25	0.0	0.57	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	3.91	4.33	3.26	0.28	0.0	1.25	0.0	0.57	*
Change in emissions	0.0	0.0	1.24	1.29	0.95	0.0	0.0	0.0	0.0	0.0	*

∗ Zero, negligible, or not applicable.

Filterable PM is based on site emission test results. NCASI memo dated August 18, 2017, on salt dissolving tank is used to estimate condensable PM material and the $PM/PM_{2.5}$ ratio. VOC and SO_2 emissions are from NCASI Technical Bulletin No. 1020. TRS and lead emissions factors were from NCASI Air Toxics Master Summary Table for Pulp and Paper Mills. Only data from 2008-2012 was used to develop project emission factors because black liquor was not recovered in 2013-2016.

3.2.3.11. Lime kiln actual (BAE)-to-projected-actual applicability test

Table 11 presents Boise's estimated emissions for the lime kiln.

Table 11: Emissions Increases of Regulated NSR Pollutants for Lime Kiln (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	6.79	52.18	45.25	49.19	49.19	1.82	0.82	4.78	29,775	4.48	0.01
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Projected emissions	10.84	66.11	37.16	41.15	41.15	1.52	0.88	5.14	35,138	4.47	0.01
Change in emissions	4.05	13.93	-8.09	-8.04	-8.04	-0.30	0.06	0.36	5,362	-0.01	0.0

∗ Zero, negligible, or not applicable.

Site-specific emissions factors were developed and used for Projected Actual Emissions for CO, NO_X, SO_2, TRS, non-condensable PM, PM_{10}, and $PM_{2.5}$.

NCASI Technical Bulletin No. 1020 was used VOC and add condensable PM10/PM2.5. Lead emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills. Sulfuric acid emission factor is from NCASI Technical Bulletin No. 973. GHG emissions factors were from 40 CFR 98, Subpart C, AA, and A.

Fuel oil was only used in 2008-2010, and Boise is still capable of burning fuel oil.

3.2.3.12. Slaker actual (BAE)-to-projected-actual applicability test

Table 12 presents Boise's estimated emissions for the slaker.

Table 12: Emissions Increases of Regulated NSR Pollutants for Slaker (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.26	0.0	0.02	0.0
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.59	0.0	0.3	0.0
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.33	0.0	0.01	0.0

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 1020 and 973 contains the emissions factors for VOC (methanol) and TRS emissions.

3.2.3.13. Fourteen percent weak black liquor tank actual (BAE)-to-projected-actual applicability test

Table 13 presents Boise's estimated emissions for the 14%-weak black liquor tank.

Table 13: Emissions Increases of Regulated NSR Pollutants for 14%-Weak Black Liquor Tank

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.10	0.0	0.88	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.10	0.0	0.88	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 1020 was used for and VOC and adjusted from carbon to methanol. TRS emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills.

3.2.3.14. Forty-four percent intermediate black liquor tank actual (BAE)-to-projected-actual applicability test

Table 14 presents Boise's estimated emissions for the 44%-intermediate black liquor tank.

Table 14: Emissions Increases of Regulated NSR Pollutants for 44%-Intermediate Black Liquor Tank (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.29	0.0	1.15	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.29	0.0	1.15	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 1020 was used and VOC adjusted from carbon to methanol. TRS emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills.

3.2.3.15. Sixty-three percent heavy black liquor tank actual (BAE)-to-projected-actual applicability test

Table 15 presents Boise's estimated emissions for the 63%-heavy black liquor tank.

Table 15: Emissions Increases of Regulated NSR Pollutants for 63%-Heavy Black Liquor Tank

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.29	0.0	1.15	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.29	0.0	1.15	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 1020 was used and VOC adjusted from carbon to methanol. TRS emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills.

3.2.3.16. Makedown tank actual (BAE)-to-projected actual applicability test

Table 16 presents Boise's estimated emissions for the makedown tank.

Table 16: Emissions Increases of Regulated NSR Pollutants for Makedown Tank (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.04	0.0	0.05	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.15	0.0	0.05	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.11	0.0	0.0	*

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 1020 and 849 was used to for VOC and TRS emissions factors.

3.2.3.17. NCG auto vent actual (BAE)-to-projected-actual applicability test

Table 17 presents Boise's estimated emissions for the NCG auto vent, which does not include the controlled emissions from the lime kiln or hog fuel furnace.

Table 17: Emissions Increases of Regulated NSR Pollutants for NCG Auto Vent (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.29	0.0	0.28	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
Projected emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.91	0.0	0.88	*
Change in emissions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.62	0.0	0.60	*

∗ Zero, negligible, or not applicable.

NCASI Technical Bulletin No. 91020 was used and VOC adjusted from carbon to methanol. TRS emissions factor was taken from NCASI Database Air Toxics Master Summary Table for Pulp and Paper Mills. The emissions were adjusted based on the actual and projected hours the bypass valve was open.

3.2.3.18. Fugitives (other than storage piles) actual (BAE)-to-projected-actual applicability test

Table 18 presents Boise's estimated emissions for Fugitives.

Table 18: Emissions Increases of Regulated NSR Pollutants for Fugitive (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	0.60	0.21	0.04	0.0	0.0	2.86	0.0	*	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
Projected emissions	0.0	0.0	1.14	0.39	0.07	0.0	0.0	4.72	0.0	*	*
Change in emissions	0.0	0.0	0.54	0.18	0.03	0.0	0.0	1.86	0.0	*	*

∗ Zero, negligible, or not applicable.

Emissions include wastewater treatment, drop points, blowers & unloading, vehicle travel. The Surface Impoundment Modeling System was used to estimate VOC emissions. Drop points/blowers/unloading emissions are based on Chapter 13.2.4 of AP-42. Vehicle travel emissions are based on Chapter 13.2.1-5 of AP-42.

3.2.3.19. Storage piles actual (BAE)-to-projected-actual applicability test

Table 19 presents Boise's estimated emissions for storage piles.

Table 19: Emissions Increases of Regulated NSR Pollutants for Storage Piles (tpy)

Emissions	CO	NO_X	PM	PM_{10}	$PM_{2.5}$	SO_2	H_2SO_4	VOC	CO_2e	TRS	Pb
BAE	0.0	0.0	2.00	1.00	0.40	0.0	0.0	16.66	0.0	*	*
Excludables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*
Projected emissions	0.0	0.0	2.32	1.16	0.46	0.0	0.0	19.33	0.0	*	*
Change in emissions	0.0	0.0	0.32	0.16	0.06	0.0	0.0	2.67	0.0	*	*

∗ Zero, negligible, or not applicable.

Emission factors are calculated following the methodology provided in Control of Open Fugitive Dust Sources dated 1988.

3.2.4. Hybrid test – significant emissions increase analysis summary

The total emission increases relating to the project is the sum of the increases and decreases from the existing units (projected actual minus baseline actual emissions) and the PTE from the proposed newly constructed units and is presented in Table 26. The federal rule defines a SER to be equal to or exceeding any of the SERs listed in Table 26 (40 CFR 52.21(b)(23)).

Boise is using EPA's Memorandum: "Project Emissions Accounting Under the New Source Review Preconstruction Permitting Program" which was published on March 30, 2018, (83 FR 13745) to determine if the project is having a significant emissions increase. Ecology is reviewing this guidance and will implement the guidance on a case by case basis. The use of the guidance did not exclude Boise from being subject to PSD (NO_X and CO). Boise did perform NO_X annual NAAQS and increment modeling within regulatory limits.

Ecology has determined that the additional review of VOC, PM_{10}, and $PM_{2.5}$ is not warranted. Since 1992, Boise has had projects to reduce emissions of PM_{10} and $PM_{2.5}$ thus expanding the increment. The non-PSD pollutants will be required to demonstrate BACT in the minor air permit.

In addition to regulated NSR pollutants, GHGs are subject to regulation as of January 2, 2011. EPA's PSD rule under 40 CFR 52.21(b)(49)(iv) states that "beginning January 2, 2011, the pollutant GHGs is subject to regulation if:

a. The stationary source is a new major stationary source for a regulated NSR pollutant that is not GHGs, and also will emit or will have the potential to emit 75,000 tpy CO_2e or more; or

b. The stationary source is an existing major stationary source for a regulated NSR pollutant that is not GHGs, and also will have an emissions increase of a regulated NSR pollutant, and an emissions increase of 75,000 tpy CO_2e or more."

Boise is an existing major stationary source for at least one regulated NSR pollutant that is not GHGs. Based on Table 26, the proposed project is expected to result in a significant increase of two (2) other NSR regulated pollutants. Therefore, because the project will result in an emissions increase of 75,000 tpy of CO_2e, the GHG emissions from the project are also subject to PSD review and are included in Table 26.

Boise triggers PSD for NOx, CO, and GHG based on increased utilization of two recovery furnaces and a lime kiln. The project emissions are estimated at 110,602 tpy of CO_2e (11,130 tpy CO_2 non-biogenic). This determination is based on the following facts. Boise #2 and #3 recovery furnaces emit carbon dioxide from industrial combustion of biomass in the form of fuel wood, wood waste, wood by-products, and wood residuals shall not be considered a GHG (state of Washington) as long as the region's silvicultural sequestration capacity is maintained or increased (RCW 70.235.020(3)). Ecology will issue the PSD permit for NO_X and CO emissions.

Only three sources have increase in project emission of total CO_2e. The project emissions increase are result of increase in utilization are as follows:

- #2 recovery furnace – 7,644 tpy of CO_2 biogenic
- #3 recovery furnace – 97,596 tpy of CO_2 biogenic
- Lime kiln – 5,364 tpy of CO_2 non-biogenic

The following is the citation from the SIP addressing biogenic GHG PSD permits in the state of Washington: § 52.2497(b) significant deterioration of air quality states the following:

> § 52.2497 (b) Regulations for preventing significant deterioration of air quality. The provisions of § 52.21, except paragraph (a)(1), are hereby incorporated and made a part of the applicable plan for Washington for the facilities, emission sources, geographic areas, and permits listed in paragraph (a) of this section. For situations addressed in paragraph (a)(~~2~~1)(i) of this section, the EPA will issue a Federal PSD permit under § 52.21 to the new major stationary source or major modification addressing PSD requirements applicable to GHGs for all subject emission units at the source, regardless of whether CO_2 emissions resulted from the industrial combustion of biomass or from other sources of GHGs at the facility. EPA will be issuing a GHG only PSD permit to cover the emissions of biogenic CO_2 emissions that are not regulated by the state of Washington.

Based on Table 20, three (3) pollutants have significant emission increases.

Table 20: Total Estimated Project Emissions, Net Emissions, and SERs

Pollutant	Project Estimated Emissions	SER (tpy)	Emissions Greater than SERs (Yes/No)
NO_X	43.76	40	Yes
CO	351.72	100	Yes
SO_2	14.91	40	No
PM	10.37	25	No
PM_{10}	11.88	15	No (>50%)
$PM_{2.5}$	6.12	10	No (>50%)
VOCs	21.12	40	No (>50%)
Lead (Pb)	<0.01	0.6	No
Sulfuric acid (H_2SO_4)	0.29	7	No
Hydrogen sulfide (H_2S)	Negligible	10	No
CO_2e (GHGs) non-biogenic	11,130	75,000	No (WA State permit for non-biogenic)
CO_2e (GHGs) biogenic	99,473	75,000	Yes (EPA permit for all GHG emissions)
Fluorides	Negligible	3	No

Pollutant	Project Estimated Emissions	SER (tpy)	Emissions Greater than SERs (Yes/No)
Total reduced sulfur (TRS)	0.0	10	No
Reduced sulfur compounds	0.0	10	No
Municipal waste combustor/landfill emissions	*	†	No

∗ The project does not involve municipal waste.
† See 40 CFR 52.21(b)(23).

3.3. Significant net emissions increase calculations

The steps necessary to calculate the net emission increase are outlined in 40 CFR 52.21(b)(3)(i).

When a netting analysis is performed, only the pollutants that have significant emission increases need to go through the analysis.

3.3.1. Netting rules

According to 40 CFR 52.21(b)(3)(i), a net emissions increase means, with respect to any regulated NSR pollutant emitted by a major stationary source, the amount by which the sum of the following exceeds zero: the increase in emissions from a particular physical change or change in the method of operation at a stationary source; and any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable.

An increase or decrease in actual emissions is contemporaneous with the increase from the particular change only if it occurs between the date five years before construction on the particular change commences; and the date that the increase from the particular change occurs.

An increase or decrease in actual emissions is creditable only if: the reviewing authority has not relied on it in issuing a permit, which is in effect when the increase in actual emissions from the particular change occurs; and the increase or decrease in emissions did not occur at a Clean Unit (with some exceptions). It also includes increase or decrease in fugitive emissions (to the extent quantifiable), for an emissions unit that is part of one of the major source categories.

An increase or decrease in actual emissions of CO, NO_X, and GHG emissions CO_2e that occurs before the applicable minor source baseline date is creditable only if it is required to be considered in calculating the amount of maximum allowable increases remaining available.

An increase in actual emissions is creditable only to the extent that the new level of actual emissions exceeds the old level.

A decrease in actual emissions is creditable only to the extent that the old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of actual emissions. It must also be enforceable as a practical matter at and after the time that actual construction on the particular change begins. It must also have approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change.

An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days.

3.3.2. Netting analysis

Boise has shut down the Bleach plant in May of 2018 and the #1 paper machine in December of 2016.

Boise's construction is expected to occur in late 2018 and be completed in 2018. Therefore, the contemporaneous period for the #3 PM project extends from 2013 through the time in 2018 when the change in project emissions occurs. Table 21 presents the Boise's estimated netting analysis changes in emissions, with specific project notes from the application included for each applicable project.

Table 21: Netting Analysis Changes in Emissions (tpy)

Project	Project Start Date	CO	NO_X	PM_{10}	$PM_{2.5}$	VOC	CO_2e	TRS
BP seal tank	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
BP scrubber	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
E2 hood exhaust	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
E2 tower	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
E1 tower	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
R8 scrubber	2018	0.0	0.0	N/A	N/A	N/A	0.0	N/A
BP general	2018	-82.94	0.0	N/A	N/A	N/A	0.0	N/A
No. 1 paper machine	2016	0.0	0.0	N/A	N/A	N/A	0.0	N/A
Net emission changes	---	-82.94	0.0	N/A	N/A	N/A	0.0	N/A

3.3.3. Significant net emissions increase analysis summary

Estimated project net emissions and SERs for each of these pollutant are shown in Table 22.

Table 22: Total Estimated Project Net Emissions and SERs

Pollutant	Net Emissions (tpy)	SER (tpy)	Net Emissions Greater than SERs (Yes/No)
NO_X	43.76	40	Yes
CO	268.78	100	Yes
CO_2e (GHGs)	110,603	75,000	Yes

Before and after netting, Boise's # 3PM product triggers PSD for the three (3) pollutants listed in Table 22.

4. BACT Review

4.1. Definitions and policy concerning BACT

All new major sources or major modifications are required to utilize BACT for those new and modified emission units that will experience an increase in emissions because of the project. BACT is defined as an emissions limitation based on the maximum degree of reduction for each pollutant subject to regulation, emitted from any proposed major stationary source or major modification, on a case-by-case basis, taking into account cost-effectiveness, economic, energy, environmental, and other impacts (40 CFR §52.21(b)(12)).

Federal guidance requires each PSD permit applicant to implement a "top-down" BACT analysis process for each new or physically or operationally changed emissions unit. Ecology has adopted the top-down BACT process for its BACT determinations. This top-down BACT analysis process consists of five basic steps described below:[2]

Step 1. Identify all available control technologies with practical potential for application to the specific emission unit for the regulated pollutant under evaluation.

Step 2. Eliminate all technically infeasible control technologies.

Step 3. Rank remaining control technologies by control effectiveness and tabulate a control hierarchy.

Step 4. Evaluate most effective controls and document results.

Step 5. Select BACT, which will be the most effective practical option not rejected, based on economic, environmental, and/or energy impacts.

If the applicant proposes to implement the most effective or "top" available control strategy, Step 4 is not necessary.

As shown above, the "top-down" BACT process starts by considering all available emission control technologies, and ranks them for further evaluation from most effective to least effective technically available control technology. The most effective emission reduction technology is then evaluated for economic feasibility. If the technology is proven infeasible based on economics, energy, or other environmental considerations, then the next most stringent level of reduction is considered. The most stringent level of emissions control that is not determined to be technically and economically infeasible is selected as BACT. While the permitting agency makes the final BACT decision, the burden is on the applicant to prove why the most stringent level of control should not be used.

Boise did not provide a 5-step top-down BACT analysis for the project, because the #3 paper machine does not directly emit NOx and CO. Boise considered the #2 M&D digester to only have direct emissions of VOC and TRS. Boise did not consider the emissions from the control

[2] See EPA's *Draft New Source Review Workshop Manual*, 1990; and PSD and Title V Permitting Guidance for Greenhouse Gases <http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf>.

device. Ecology considered the NO_X and CO emissions from the kiln and hog fuel boiler to be subject to BACT.

4.2. BACT analysis for #3 paper machine and #2 M&D digester (NCG)

This section presents a BACT analysis for the applicable emission units and their pollutants for #3 paper machine.

4.2.1. Available control technologies NO_X and CO controls

Boise recently used direct drying of the wet paper sheet. The elimination of direct drying will eliminate emissions of NO_X and CO from the #3 paper machine is determined to be BACT.

The #2 M&D digester is controlled by the NCG system. The NCG system has three control options, lime kiln (primary control), hog fuel boiler, and auto vent (uncontrolled). The kiln and hog fuel boiler will combust VOC/fuel to form NO_X and CO. The increase in emissions is estimated to be less than 1.0 tpy of each pollutant per emission point.

4.2.2. BACT feasibility review

Table 23 addresses the technical feasibility of implementing each control technology from Section 4.2.1. for the project.

Table 23: Technical Feasibility Assessment

Emission Unit(s)	Control	Technical Feasibility Assessment	Applicable Pollutants
#3 paper machine	Direct drying	Technically feasible	NO_X, CO and GHG
#3 paper machine	Steam drying	Technically feasible	Increase utilization of #2 and #3 recovery furnaces
#2 M&D digester (NCG)	NO_X & CO controls	Technically feasible	NO_X and CO (minor emissions)
#2 M&D digester – lime kiln controls	Lime kiln with a minimum temperature of 1200°F (650°C) for at least 0.5 second, consistent with 40 CFR 60.283a(a)(1)	Technically feasible	CO

Emission Unit(s)	Control	Technical Feasibility Assessment	Applicable Pollutants
#2 M&D digester – hog fuel boiler	Hog fuel boiler with a minimum temperature of 1200°F (650°C) for at least 0.5 second, consistent with 60 CFR 283a(a)(1). Limited to 1,200 hours per year.	Technically feasible	CO

BACT (NO_X and CO) for the #3 paper machine is the use of steam drying and the shutdown of direct drying.

BACT (NO_X) for lime kiln and hog fuel boiler is limiting the increase in emissions to less than 1 tpy.

BACT (CO) for lime kiln and hog fuel boiler is maintaining a combustion temperature of at least 1200°F (650°C) consistent with 40 CFR 60.283a(a)(1)(iii).

4.2.3. #2 D&M digester modification

This section addresses NO_X and CO control including: ranking of control technologies; evaluating economic, energy, and environmental impacts; and selection of BACT for NO_X and CO. Emissions from the #2 M&D digester are vented to the non-condensable gas vent (NCG) system. The NCG is a combination of various high concentrations of TRS compounds and VOCs, which can be controlled by the lime kiln, hog fuel boiler, or auto vent. The primary control is the lime kiln, which is subject to the following requirements for:

The No. 1 and No. 2 M&D digesters TRS – Treat all collectible NCG to reduce VOC emissions equal to reduction achieved by thermal oxidation in a lime kiln or other combustion unit. This results in emissions of NO_X and CO. The Mill is currently subject to 40 CFR 63.450 (40 CFR 63.443) and 40 CFR 60.283(a)(1)(iii) which requires the combustion in a lime kiln or other combustion device (hog fuel boiler) subject to the minimum temperature of 1200°F (see 4.3.2 of Boise's application).

4.3. Toxic air pollutants (TAP)

PSD rules require the applicant to consider emissions of TAPs during the course of a BACT analysis, but specifically exempt all pollutants subject to regulation under Section 112 of the federal Clean Air Act from regulation under the PSD program.

The emissions of TAPs will be covered in the Ecology's industrial air permit NOC approval for this project.

5. Ambient Air Quality Impacts Analysis

5.1. Regulatory requirements

For PSD, an ambient Air Quality Impacts Analysis (AQIA) is required for all pollutants that are emitted in significant quantities to determine the ambient impacts associated with the construction and operation of the proposed modifications. The main purpose of the air quality analysis is to demonstrate that new emissions emitted from the proposed major stationary source or major modification will not cause or contribute to a violation of any applicable NAAQS or PSD increment.

The input to the models can be broken down into long term and short-term impact analysis. The long-term impact are determine based on the difference between the projected actual emissions and actual emissions defined in 40 CFR 52.21(b)(21).

(i) Actual emissions means the actual rate of emissions of a regulated NSR pollutant from an emissions unit, as determined in accordance with paragraphs (b)(21)(ii) through (iv) of this section, except that this definition shall not apply for calculating whether a significant emissions increase has occurred, or for establishing a PAL under paragraph (aa) of this section. Instead, paragraphs (b)(41) and (b)(48) of this section shall apply for those purposes.

(ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a consecutive 24-month period which precedes the particular date and which is representative of normal source operation. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

(iii) The Administrator may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

(iv) For any emissions unit that has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.

Federal and Washington State PSD regulations require a demonstration that the project does not cause or contribute to a violation of the NAAQS (WAC 173-720(4)(a)(vi) and 40 CFR 52.21(k).

The following is a summary of the long-term inputs used for the modeling files (NO_X SIL):

Table 24: NO_X SIL Modeling Input Files

Source/Emissions	Actual Emissions (2015-2016) Grams/Second	Project Actual Emissions Grams/Second	Increase in Emissions Grams/Second
#3 Paper Machine	None	None	None
#2 Recovery furnace	0.4155	2.037	1.6215
#3 Recovery Furnace	7.35	9.535	2.185
Lime Kiln	1.848	1.902	0.0540
Hog Fuel Boiler	6.912	6.912	None
Power Boiler 1	1.374	1.374	None
Power Boiler 2	1.528	1.1528	None

Note: Emission rate is based on 8760 hours.

The AQIA starts with preliminary modeling for each pollutant to determine whether an applicant can forego detailed analysis and preconstruction monitoring. If the projected ambient concentration increase for a given pollutant is below the PSD Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMCs) for each averaging period, no further analysis of the ambient impact is required for that pollutant. While secondary emissions are not included when determining PSD applicability, they are included when considering air quality impacts. The impacts to Class I and Class II areas (see Tables 31 and 36, respectively).

For those pollutants with averaging periods that have impacts greater than the SIL, a full impact analysis (taking into account other increment consuming sources) is used to demonstrate compliance with NAAQS and PSD increments.

Typically, the AQIA includes an analysis of impacts to local areas that are within 50 kilometers (km) of the project, and a regional air quality impact assessment for impacts beyond 50 km. For projects in Washington State, this latter analysis usually includes impacts on Class I areas.

The AERMOD dispersion model was used for predicting local impact concentrations. The background NO_2 concentration was from NW AirQuest Consortium (2009-2011 design values). Community Multi-Scale Air Quality (CMAQ) model was used to develop the background concentrations.

5.2. Maximum criteria pollutant concentrations predicted by AERMOD

Using project emissions only, AERMOD predicted impacts for criteria pollutants compared to SILs and Monitoring de minimis levels or SMCs are presented in Table 25.

Table 25: Maximum Criteria Pollutant Concentrations Predicted by AERMOD for Class II

Criteria Pollutant	Avg. Period	Max AERMOD Concentration in Class II Areas (µg/m^3)	SIL (µg/m3)	SMC (µg/m3)	Is AERMOD Concentration Greater than Applicable SIL or SMC?
NO_X	Annual	1.28	1	14	SIL Yes

Because the project impacts are greater than the SILs, a full impact analysis (taking into account other increment consuming sources) is required to demonstrate compliance with NAAQS and Class II PSD increments. NAAQS compliance is assumed and compliance with WAAQS is assumed by compliance with NAAQS.

In addition to considering NAAQS, Ecology also considered the general vicinity around this project about general environmental justice concerns. In Ecology's analysis, it is noted that Section 6 of this TSD considered construction and area growth affects (temporary and minimal) due to this project as well as visibility (stack plumes dissipate short distances from the facility due to dispersion and evaporation, of which this project is only a small contributor). Based on this information, along with consideration of the general population of the area, Ecology concludes that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants because of this project.

The modelled impact was less than the SMC (14µg/m^3 annual average) therefore, pre-construction monitoring may be avoided, per 40 CFR 52.21(i)(5)(i).

Cumulative (Full) Impact Analysis

Full impact analysis is required for the pollutant that exceeded the SIL in the screening analysis. Boise exceeded the Class II SIL for the annual NO_X therefore increment and NAAQS analysis is required. The annual emissions rates that were modelled is contained in Table 26.

Boise – Modified Units/Annual Emissions

1. #3 paper machine – no increase in NO_X emissions
2. #2 M&D digester – no direct increase in NO_X emissions
    a. Increase in VOC control by the lime kiln or hog fuel boiler (see below).

Boise – Increased Utilization

1. No. 2 recovery furnace
2. No. 3 recovery furnace
3. Lime kiln

Boise – Unaffected Units

1. Two power boilers
2. Hog fuel boiler (minor increase in VOC/fuel from the NCG due to #2 M&D modification).

Facilities in the Area

The major PSD baseline for annual NO_X was established on February 8, 1988, and the minor baseline was established on February 11, 1992.

Boise exceeded the Class II SIL for the annual NO_X therefore increment and NAAQS analysis is required and minor baseline on Feb 11, 1992, can be used to offset the increases from the baseline year. The following companies' emissions for 2015-2016 were used for the NAAQS and increment evaluations in Tables 26 and 27.

The following is a summary of the Boise long-term inputs for the modeling files (NO_X NAAQS).

Table 26: NAAQS Input Files from Boise

Source/Emissions	NO_X Emissions Grams/Second	Basis
#3 paper machine	None	None
#2 recovery furnace	3.203	Emission factor and potential daily throughput
#3 recovery furnace	23.73	Allowable NO_X emission limit
Lime kiln	4.174	Emission factor and potential daily throughput
Hog fuel boiler	9.862	Allowable NO_X emission limit and 24-month average production rate
Power boiler 1	1.374	Emission factor and 24-month average throughput
Power boiler 2	1.528	Emission factor and 24-month average throughput

Boise adjusted the 1992 emissions data based on actual data or improved emission factors with more current emission inventory. No project at Boise's facility expanded the increment. The 1992 baseline data was not used for nearby sources, which is more conservative.

The following is a summary of the nearby sources long-term inputs used for the modeling files (NO_X NAAQS and increment):

Table 27: NAAQS and Increment Input Files from Nearby Sources

Source/Emissions	NO_X Emissions Grams/Second
Sandvik Special Metals LLC – Etching 1	0.187
Sandvik Special Metals LLC – Etching 2	0.187
Sandvik Special Metals LLC – Etching 3	0.187
Greenbriar Rail Services	0.01942
Gas Transmission Northwest Station 8 – Unit 8B	0.4667
Gas Transmission Northwest Station 8 – Unit 8C	2.945
Gas Transmission Northwest Station 8 – Unit 8A	0.6829
Gas Transmission Northwest Station 8 – Auxl	0.004315
Agrium US Inc – Plant 9	1.256
Agrium US Inc – Boiler	0.0489
Agrium US Inc – Nitric acid concentrator	0.03596
Agrium US Inc – Plant 8	0.09205
Agrium US Inc – NG flare	0.00374
Agrium US Inc – Finley flare	0.002301
LAMPSON INTERNATIONAL LTD	0.1968
TIDEWATER TERMINAL COMPANY - SNAKE RIVER	1.153
ANDEAVOR LOGISTICS OPERATIONS LLC - PASCO TERMINAL	0.7899
TYSON FRESH MEATS INC	0.1102

Note: Emissions are based on average of 2015-2016 emission inventory.

The following is a summary of the Boise long-term inputs used for the modeling files (NO_X increment):

Table 28: NO_X Increment Input Files from Boise

Source/Emissions	Modeling Rates NO_X Emissions Grams/Second	1992 Baseline Modeling Rates NO_X Emissions Grams/Second	Basis
#3 paper machine	None	None	None
#2 recovery furnace	3.203	---	Emission factor and potential daily throughput
#3 recovery furnace	23.73	-8.285	Allowable NO_X emission limit
Lime kiln	4.174	-2.877	Emission factor and potential daily throughput

Source/Emissions	Modeling Rates NO_X Emissions Grams/Second	1992 Baseline Modeling Rates NO_X Emissions Grams/Second	Basis
Hog fuel boiler	6.912	-6.703	2015-2016 average emission rate
Power boiler 1	1.374	-0.2385	2015-2016 average emission rate
Power boiler 2	1.528	-1.461	2015-2016 average emission rate

The Class II NO_X annual SIL was exceeded therefore the NAAQS (100 µg/m^3) and Class II increment (25 µg/m^3) were evaluated and are summarized in Table 29.

Federal and Washington State PSD regulations require a demonstration that the project does not cause or contribute to a violation of the NAAQS or increment (WAC 173-113(3) and WAC 173-720(4)(a)(vi) and 40 CFR 52.21(k). Only receptors exceeding the SIL in the significance models will be included in the NAAQS and increment evaluation. Emission sources affected by the project are modeled at their allowable emission rate. Emission sources unaffected by the project are treated like nearby sources, and their emissions rates are calculated using the maximum allowable emission limit and average throughput of the two most recent years (2015-2016), per Table 8-2 of Appendix W.

Table 29: Maximum Criteria Pollutant Concentrations Predicted by AERMOD for Class II

Criteria Pollutant	Avg. Period	Max AERMOD Concentration in Class II Areas and Background (µg/m^3)	NAAQS (µg/m^3)	Increment (µg/m3)	Is AERMOD Concentration Greater than Applicable NAAQS or Increment?
NO_X	Annual	31.48	100	---	No
NO_X	Annual	7.24	---	25	No

The background design value for Wallula NO_X is 4.4 ppb (8.28ug/m^3) and modeled NAAQS concentration of 23.31 µg/m^3.

5.3. Ozone impacts

NO_X and VOCs are precursors to ozone. Because the proposed emission increases in VOCs and NO_X from the #3 paper machine will not exceed 100 tpy for either pollutant, a demonstration that the project would not cause or significantly contribute to a violation of the ozone NAAQS was not required.

5.3.1. Ozone background information

EPA has set primary and secondary ozone standards to protect human health and welfare. On March 12, 2008, EPA revised the primary and secondary ozone standards to 0.075 ppm for an 8-hr average. And, EPA lowered it again in December 2015 to 0.070 ppm for an 8-hr average.

Ozone is formed in the troposphere when sunlight causes complex photochemical reactions involving NO_X, VOCs, and CO that originate chiefly from gasoline engines and burning of other fossil fuels. Woody vegetation is another major source of VOC emissions to NO_X emissions within the surrounding airshed, and the relative reactivities of the VOC species. NO_X and VOCs can be transported long distances by regional weather patterns before they react to create ozone in the atmosphere, where it can persist for several weeks. Because ozone is a regional pollutant, precursor sources both near and far can contribute to ozone formation.

Breathing ozone can trigger a variety of health problems for humans, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Elevated levels of ozone can also reduce lung function by inflaming the linings of the lungs. Repeated exposure to elevated concentrations of ozone may permanently scar lung tissue. Ozone is also phytotoxic, causing damage to a variety of vegetation (Ashmore et al., 2004). Ozone pollution has been shown to reduce plant growth, alter species composition, and predispose trees to insect and disease attack. Ozone also causes direct foliar injury to some plant species. Ozone affected leaves are marked with discoloration and lesions, and they age more rapidly than normal leaves (EPA, 2007).

Ozone enters plants through leaf stomata, causing changes in biochemical and physiological process. The mesophyll cells under the upper epidermis of leaves are the most sensitive to ozone, and those are the first cells to die. The adjacent epidermal cells then die, forming a small black or brown interveinal necrotic lesion that becomes visible on the upper surface of the leaf. These lesions, termed oxidant stipple, are quite specific indicators that the plant has been exposed to ozone. Other plant symptoms can result from exposure to ozone. However, these symptoms are non-specific for ozone since other stressors can also cause them to occur. In general, the most reliable indicator that ozone has impacted vegetation is oxidant stipple.

In addition to effecting individual plants, ozone can also affect entire ecosystems. Plants growing in areas with high exposure to ambient ozone may undergo natural selection for ozone tolerance (EPA, 2007). The result could be the elimination of the most ozone sensitive genotypes from the area (National Park Service, 2010).

While VOCs and NO_X are recognized as precursors to the formation of ground level ozone, which is regulated as a criteria pollutant, the FLAG guidance states that "current information indicates most FLM areas are NO_X limited" with respect to the formation of ground level ozone. A NO_X limited region is one where the concentration of ozone depends on the amount of NO_X in the atmosphere. This occurs when there is a lack of nitrogen dioxides, thus inhibiting ozone titration when oxygen mixes with VOCs. In these regions, controlling NO_X would reduce ozone concentrations. A VOC's limited region is one where concentration of ozone depends on the amount of VOCs in the atmosphere. In these regions, controlling VOCs would reduce ozone concentrations. The FLAG guidance further states that "until there is enough information available for FLAG to determine whether ozone formation in each FLM area is primarily limited by NO_X or VOC emissions, we will assume all FLM areas are NO_X limited and will focus on control of NO_X emissions" (FLAG Executive Summary and Section 3.4.5).

5.4. Impacts on Class I areas

As shown in Table 30, project impacts in Class I areas are not greater than the SILs. Therefore, a full impact analysis (taking into account other increment consuming sources) is not required to demonstrate compliance with NAAQS and PSD increments.

Table 30: Maximum Criteria Pollutant Concentrations Predicted by AERMOD for Class I

Criteria Pollutant	Avg. Period	Max AERMOD Concentration in Class I Areas (µg/m³)	SIL (µg/m³)	Is AERMOD Concentration Greater than Applicable SIL?
NO_X	Annual	0.00719	0.1	No

However, in addition to addressing NAAQS and PSD increments, PSD rules require an analysis of air quality related values (AQRVs) on federally mandated Class I areas. Class I areas are defined in the Clean Air Act as having special national or regional value from a natural, scenic, recreational, or historic perspective. Class I areas include national parks over 6,000 acres and wilderness areas and memorial parks over 5,000 acres as of 1977. The impacts to these areas are stringently regulated because they have remained relatively untouched by development.

5.4.1. AQRV background information

PSD regulations and guidance require additional impact analyses to evaluate the effects of the project's emissions on visibility, local soils, and vegetation in Class I and in Class II areas (see Section 6), and the effect of increased air pollutant concentrations on flora and fauna in the Class I areas. The additional impact analyses are also used to evaluate the effect of the project on growth in the area surrounding the project in Class II areas (see Section 6).

The analyses assess increment consumption and impacts on AQRVs in Class I areas. AQRVs include regional visibility or haze, the effects of primary and secondary pollutants on sensitive plants, the effects of pollutant deposition on soils and receiving water bodies, and other effects associated with secondary aerosol formation. The FLMs for the National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service have the responsibility of ensuring AQRVs in the Class I areas are not adversely affected. The Federal Land Managers' (FLMs) guidance on evaluating impacts of major projects on Class I areas is the *Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase I Report – revised* (2010) (National Park Service, 2010).

In FLAG, the FLMs have developed a tool to screen out projects that would not have a significant impact on AQRVs based on annual emissions and distance from a Class I area. This screening tool is called the Q/D Method, which is to divide the amount of emission increases in tons per year (Q) by the distance to a federal Class I area in km (D). FLAG states that "The FLM role within the regulatory context consists of considering whether emissions from a new source, or emission increases from a modified source, may have an adverse impact on AQRVs and providing comments to permitting authorities. Therefore, the agencies will consider a source locating greater than 50 km from a Class I area to have negligible impacts with respect to Class I

AQRVs if its total SO_2, NO_x, PM_{10}, and H_2SO_4 (sulfuric acid) annual emissions (in tons per year, based on 24-hour maximum allowable emissions), divided by the distance (in km) from the Class I area (Q/D) is 10 or less. The agencies would not request any further Class I AQRV impact analyses from such sources. Boise calculated Q at 6.16 tpy based on emissions increases from the modification of the #3 Paper Machine and #2 M&D digester vented to the NCG vent. The NCG vent has three emissions options, direct vent, Lime Kiln, and Hog fuel boiler.

5.4.2. Boise AQRV analysis

For the Boise's #3 PM project, the only pollutants that would have a significant net increase are NO_X, CO, and GHG. Q (tpy) is defined on page 24 of the Flag guidance as the tpy of the PM10, SO_2, NO_X, and H_2SO_4 that have a net increase in the 24-hour allowable rate. The Q/D values for each Class I area in Washington is presented in Table 31. Q was determined to be 6.16 tpy (PM_{10} – 4.55 and SO_2 – 1.61).

Table 31: Class I Areas within 200 km of the Boise Facility

Area	Distance (D) from Boise to Class I Area (km)	Quantity (Q) of Max 24-hr Emission Increase (tpy)	Q Divided by D (Q/D) (tons/km)	Is Q/D Less than 10? (Yes/No)
Eagle Cap Wilderness Area	113	6.16	0.06	Yes
Hells Canyon Wilderness Area	195	6.16	0.03	Yes

Because Q/D is less than 10 for all areas in Table 37, additional Class I AQRV impact analyses are not required. Also as explained in Section 5.2, because project impacts are greater than the SILs, a full impact analysis (taking into account other increment consuming sources) is required to demonstrate compliance with NAAQS and Class II PSD increments. NAAQS compliance is assumed and compliance with WAAQS is assumed by compliance with NAAQS.

5.4.2.1. Soils and receiving water bodies (deposition)

Ecology did not require Boise to perform a deposition analysis because the project emission rates for SO_2 are below the SERs and the Q/D is less than 10. In addition, the other pollutants emitted by the project are not expected to contribute to impacts on soil and vegetation in the area surrounding the Wallula Mill.

5.4.2.2. Visibility (Class I areas)

Because Q/D is less than 10 for all areas in Table 37, a visibility analysis in Class I areas is not required.

6. Additional Impacts Analysis

6.1. Construction and growth impacts

The project will increase traffic. No new area homes or industry is anticipated during construction or after construction because of the project. Impacts from new commercial development are assumed minimal, as the project will occur within the existing fenceline of Boise property.

The number of employees at Boise is expected to remain the same because of this project. During construction of this project, there will be approximately 700 additional employees on-site. The existing traffic on the main highway to the facility (Washington State Route 12) will increased traffic due to construction and once operational, are both expected to be negligible by comparison.

During this time, there will be increased traffic congestion, increased vehicle emissions, and increased demand for local skilled workers. However, because construction is expected to last only 3 weeks, these increases are expected to be temporary and insignificant. Therefore, the proposed project is not expected to cause adverse construction and growth related impacts.

6.2. Visibility

As noted in the application, the 1990 draft NSR Workshop Manual provides the following description of a Class II visibility analysis in Chapter D, Section II.D:

"In the visibility impairment analysis, the applicant is especially concerned with impacts that occur within the area affected by applicable emissions. Note that the visibility analysis required here is distinct from the Class I area visibility analysis requirement. The suggested components of a good visibility impairment analysis are:" (addressed for each below the listed components in italics font):

- *"a determination of the visual quality of the area,"*

Regarding area regional haze, pre-existing visible water vapor (steam) plumes can be seen from the mill which dissipate short distances from the facility due to dispersion and evaporation.

- *"an initial screening of emission sources to assess the possibility of visibility impairment, and"*

The project emissions are located within the existing Paper Machine buildings and stacks so that after the project is completed, the project emission sources are likely to increase water vapor impair local visibility.

- *"if warranted, a more in-depth analysis involving computer models."*

As noted in the application: "The Q/D screening values for the Project indicate that emissions from the Project will not significantly impact visibility in either Class I or sensitive Class II

areas." Normally for other Class II areas, the analysis provided for regional haze appears to be sufficient. The National Park Service requested that the Whitman Mission National Historic Site be evaluated for visibility impacts (Not a Class I area). Boise used Level 1 VISCREEN to evaluate visibility impacts. The inputs to the model were NO_X - 0.0 lb/hr and PM_{10} - 1.45 lb/hr. The model used a distance is 35.2–36.3 km.

Table 32: Level 1 VISCREEN Results – Whitman Mission National Historic Site (Class II Area – Request of the National Parks Service)

	Highest Value	Casual Observer Perceptibility	Best-Estimate Observer Perceptibility	Lower-Bound Observer Perceptibility
Delta E	0.072	2	0.8	0.2
Contrast	0.001	0.05	0.02	0.005

Note: For information only. No regulatory levels of concern.

6.3. Soils and vegetation analysis

Regarding economic impacts of the project on vegetation and soils, or agriculture and forestry, the project emissions comply with primary and secondary NAAQS, which were intended to address factors such as soils and vegetation.

The following excerpt from the application, which further addresses project impacts on soils and vegetation, is pasted below:

"For most types of soils and vegetation, ambient concentrations of criteria pollutants below the secondary NAAQS will not result in harmful effect. Comparison to these standards is used as the primary criteria for determining whether or not the No. 3 Paper Machine rebuild project will result in significant impacts on soil and vegetation in the area. Since the modeling analysis demonstrated compliance with the primary and secondary NO2 NAAQS, the No. 3 Paper Machine rebuild project will not cause any significant air quality imparts on the soil and vegetation in the area."

Based on these impacts in the application, Ecology believes Boise has satisfactorily addressed project impacts on Class II soils and vegetation.

7. Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Ecology conducts EJ review to ensure no group of people bears a disproportionate share of the negative environmental consequences as the result of the permitting action.

The initial step in this review is to identify any affected populations or communities of concern. Ecology used EPA's environmental justice screening and mapping tool EJSCREEN. The area of the map shown below, which includes a total of 121 square miles was selected for the analysis.

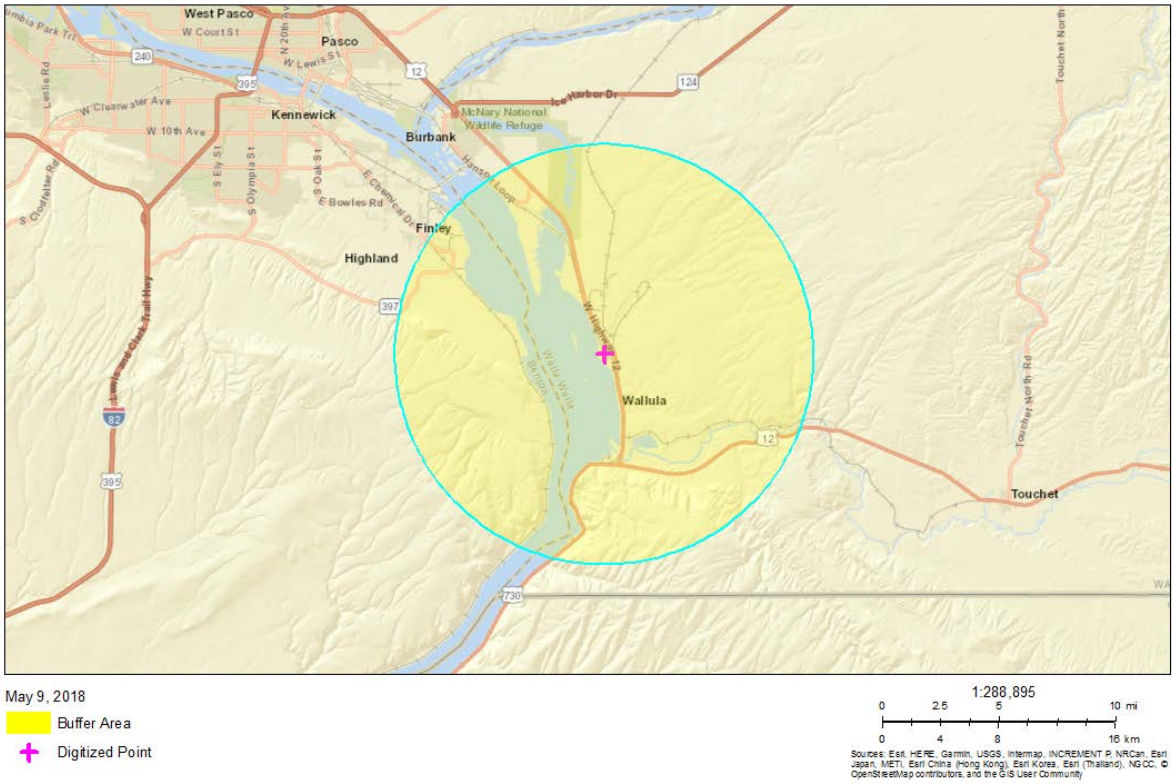

Figure 3: Environmental Justice Screening Map

The EJSCREEN American Community Survey (ACS) report estimates that approximately 29 percent of the population (1,582) in the area consists of minorities, with approximately one percent of the total population speaking English "less than well." A copy of the ACS report with more detailed information will be filed as part of the supporting documentation for the project.

The NAAQS analysis indicates that the project is protective of the community as a whole and no other review is needed. It also appears that a majority of the population in the selected area can understand and speak English proficiently. Ecology is not expecting any communication barrier to posting notice on the legal page of the predominant newspaper in the Wallula area in both English and Spanish. Ecology also determines that an enhanced outreach effort is not needed due to the nature and scope of this project.

8. State Environmental Policy Act

Under Washington State rules, a final PSD permit shall not be issued for a project until the applicant has demonstrated that State Environmental Policy Act (SEPA) review has been completed for the project. Ecology's Industrial Section is the lead agency for SEPA.

On August 9, 2018, Ecology's Industrial Section issued the SEPA Determination of Nonsignificance. The public comment period for the SEPA determination ended on September 14, 2018.

Ecology concludes that the applicant has adequately demonstrated compliance with SEPA requirements.

9. Public Involvement

This PSD permitting action is subject to a minimum 30-day public comment period under WAC 173-400-740. A newspaper public notice announcing the public comment period was published in the Tri-City Herald on August 13, 2018. In accordance with WAC 173-400-740(2)(a), application materials was made available for public inspection at:

Burbank Library Burbank Library
875 S. Lake Road
Burbank, WA 99323
509-545-6549

Washington Department of Ecology
Air Quality Program
300 Desmond Drive SE
Lacey, WA 98503
360-407-6800

- A public hearing on the proposed PSD was held on September 13, 2018, at the Burbank Library Burbank Library, Walla Walla County Rural Library District, in Burbank, WA.
- The public comment period closed for PSD 18-01 on September 14, 2018. No comments were received for the PSD permit.

10. Agency Contact

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Acronyms and Abbreviations

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
ALW	Alpine Wilderness
AQIA	Air Quality Impacts Analysis
AQRV	Air Quality Related Values
BACT	Best Available Control Technology
CARB	California Air Resources Board
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
FLAG	Federal Land Managers' Air Quality Relative Values Workgroup
FLM	Federal Land Manager
FR	Federal Register
GHG	greenhouse gas
H_2SO_4	sulfuric acid mist
HAPs	hazardous air pollutants
hr/yr	hours per year
kW	Kilowatt
MACT	maximum achievable control technology
NAAQS	National Ambient Air Quality Standards
NCG	Noncondensible gas
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction
NO_X	nitrogen oxides
NPS	National Park Service
NSR	New Source Review
NSSC	Neutral Sulfite Semi-Chemical
PM	particulate matter

PM_{10}	particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTE	potential to emit
Q/d	emissions to distance
RBLC	RACT/BACT/LAER Clearinghouse
SCR	selective catalytic reduction
SEPA	State Environmental Policy Act
SER	significant emission rate
SIL	significant impact level
SO_2	sulfur dioxide
SO_X	sulfur oxides
TAP	toxic air pollutant
tpy	tons per year
TRS	Total Reduced Sulfur
VOC	volatile organic compound
WAC	Washington Administrative Code